

Appl. No. 09/924,199  
Amdt. dated 6/12/06  
Reply to Office Action of 2/7/06

PATENT  
Docket: 010196

### REMARKS

Claims 1-30 are pending in the present application. Claims 1-30 have been examined, claims 1-3, 7, 8, 10-13, 15-19, 21-24, 26, 29 and 30 are rejected, and claims 4-6, 9, 14, 20, 25, 27 and 28 are allowable. In the above amendments, claims 1, 4, 6, 7, 9-14, 17-21, 23 and 26-29 have been amended. Therefore, after entry of the above amendments, claims 1-30 will be pending in this application. Applicant believes that the present application is now in condition for allowance, which prompt and favorable action is respectfully requested.

#### Allowable Claims 4-6, 9, 14, 20, 25, 27 and 28

Claims 4-6, 9, 14, 20, 25, 27 and 28 are objected to as being dependent upon rejected base claims, but would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

Claims 4, 9, 20, 27 and 28 have been amended to include limitations of their original base claims. Claims 5 and 6 are dependent on claim 4. Claims 4-6, 9, 20, 27 and 28 are in condition for allowance.

#### Rejection of Claims 1 and 19 Under 35 U.S.C. §102(e)

Claims 1 and 19 stand rejected under 35 U.S.C. §102(e) as being anticipated by Stirling-Gallacher *et al* (U.S. Patent Publication No. 2002/0001352).

Stirling-Gallacher discloses a channel estimator for an OFDM system. In FIG. 3, pilot symbols (represented by circles) are transmitted on some frequency subcarriers and in some timeslots. Channel estimates for pilot symbol locations can be derived based on the pilot symbols. (See paragraph [0008].) Channel estimates for data symbol locations (represented by squares) can be derived by filtering the channel estimates for the pilot symbol locations. (See paragraph [00010].)

Claim 1 of the present invention, which has amended to include the limitation of original claim 11, recites:

“A method for generating pilot estimates indicative of a response of a communication channel between a transmitter unit and a receiver unit, comprising:  
estimating one or more characteristics of the communication channel based on received pilot symbols; and

Appl. No. 09/924,199  
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PATENT  
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filtering the received pilot symbols in accordance with a particular pilot filter response to provide filtered pilot symbols that comprise the pilot estimates, wherein the particular pilot filter response is selected from among a plurality of possible pilot filter responses associated with a plurality of different bandwidths based on the one or more estimated channel characteristics.”

Applicant submits that claim 1 is not anticipated by Stirling-Gallacher for at least the following reasons.

First, Stirling-Gallacher does not disclose “estimating one or more characteristics of the communication channel based on received pilot symbols,” as recited in claim 1. Rather, Stirling-Gallacher states “the estimated carrier-to-interference ratio at the frequency subcarrier and the timeslots of the data symbol to be channel estimated is used for the filter selection.” (See paragraphs [0018] and [0027].) Stirling-Gallacher performs interpolation to derive channel estimates for data symbol locations and uses a different criterion for filter selection.

Second, Stirling-Gallacher does not disclose “the particular pilot filter response is selected from among a plurality of possible pilot filter responses associated with a plurality of different bandwidths,” as recited in claim 1. The rejection indicates that Stirling-Gallacher does not disclose this feature of claim 1.

However, with regard to claim 11, the rejection indicates that Jacobsson (U.S. Patent No. 6,977,978) discloses “a plurality of filter coefficients are associated with bandwidths” and thus teaches the above feature of claim 1. Applicant submits that claim 1 is patentable over Stirling-Gallacher in view of Jacobsson for at least the following reasons. First, Jacobsson discloses data filters used to filter data symbols, and not pilot symbols. The filters of Jacobsson are used for a different application (to filter data symbols) and have a different selection criterion (adjacent channel power) than the pilot filter of claim 1. Second, there is no suggestion or motivation to combine the data filters of Jacobsson with the pilot filter of Stirling-Gallacher. Jacobsson and Stirling-Gallacher address different communication problems - data filtering for adjacent channel interference and channel estimation for time-frequency locations without pilot symbols.

For at least the above reasons, Applicant submits that claim 1 is not anticipated by Stirling-Gallacher and is further patentable over Stirling-Gallacher in view of Jacobsson.

Appl. No. 09/924,199  
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Docket: 010196

Independent claim 19 recites the features noted above for claim 1. Claim 19 is not anticipated by Stirling-Gallacher and is also patentable over Stirling-Gallacher in view of Jacobsson for at least the reasons noted for claim 1.

Accordingly, the §102(e) rejection of claims 1 and 19 should be withdrawn.

**Rejection of Claims 2, 3, 7, 8, 10-13, 15-18, 21 and 22 Under 35 U.S.C. §103(a)**

Claims 2, 3, 7, 8, 10-13, 15-18, 21 and 22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Stirling-Gallacher in view of various other references. The rejection indicates that Stirling-Gallacher discloses the features of base claims 1 and 19 and that the other references disclose the additional features of dependent claims 2, 3, 7, 8, 10-13, 15-18, 21 and 22.

Claims 2, 3, 7, 8, 10-13, and 15-18 are dependent on claim 1. Claims 21 and 22 are dependent on claim 19. Stirling-Gallacher does not disclose all of the elements of base claims 1 and 19, as discussed above. Hence, Stirling-Gallacher is an insufficient basis for the §103(a) rejection of dependent claims 2, 3, 7, 8, 10-13, 15-18, 21 and 22.

**Rejection of Claims 23 and 24 Under 35 U.S.C. §103(a)**

Independent claim 23 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Stirling-Gallacher in view of Leung (U.S. Patent No. 6,671,268). Claim 24 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Stirling-Gallacher and Leung and further in view of Perets (U.S. Patent Publication No. 2003/0003889).

Leung discloses channel estimation in a CDMA system. A pilot filter 216 generates channel estimates from a pilot signal. A predictive channel estimator 310 generates predictive channel estimates from an original traffic signal demodulated by reconstructed traffic information bits. (See the Abstract.) A controller 312 combines the output of pilot filter 216 and the output of predictive channel estimator 310 preferably using a dynamic weighted combining technique. (See column 5, lines 38-55.)

Claim 23 of the present invention, as amended, recites:

“A method for generating pilot estimates indicative of a response of a communication channel between a transmitter unit and a receiver unit, comprising:

filtering received pilot symbols in accordance with a plurality of filter responses to provide a plurality of sequences of filtered pilot symbols;

Appl. No. 09/924,199  
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PATENT  
Docket: 010196

deriving prediction errors for each filter response indicative of errors between the received pilot symbols applied to the filter response and the filtered pilot symbols provided by the filter response; and  
providing the filtered pilot symbols derived from the filter response associated with minimum prediction errors as the pilot estimates.”

Applicant submits that claim 23 is patentable over Stirling-Gallacher in view of Leung for at least the following reasons.

First, neither Stirling-Gallacher nor Leung disclose “filtering received pilot symbols in accordance with a plurality of filter responses,” as recited in claim 23. Rather, Stirling-Gallacher selects an appropriate filter for channel estimation and uses the selected filter. Stirling-Gallacher thus filters the channel estimates with one selected filter. Leung similarly uses one pilot filter.

Second, neither Stirling-Gallacher nor Leung disclose “deriving prediction errors for each filter response and indicative of errors between the received pilot symbols applied to the filter response and the filtered pilot symbols provided by the filter response,” as recited in claim 23. Leung generates two types of channel estimates - channel estimates based on a pilot signal and “predictive” channel estimates based on a traffic signal. Leung then combines the two types of channel estimates. The predictive channel estimates of Leung are simply generated based on a different signal. Leung does not determine prediction errors between the received pilot symbols and the filtered pilot symbols, as recited in claim 23.

For at least the above reasons, Applicant submits that claim 23 is patentable over Stirling-Gallacher in view of Leung. Claim 24 is dependent on claim 23 and is patentable for at least the reasons noted for claim 23.

Accordingly, the §103(a) rejection of claims 23 and 24 should be withdrawn.

**Rejection of Claims 26, 29, and 30 Under 35 U.S.C. §103(a)**

Independent claim 26 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Leung in view of Perets (U.S. Patent Publication No. 2003/0003889). Claim 29 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Leung and Perets and further in view of Jacobsson. Independent claim 30 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Leung and Perets and further in view of Wang (U.S. Patent No. 6,125,137).

Appl. No. 09/924,199  
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Applicant submits that claim 26 is patentable over Leung in view of Perets for at least the following reasons.

First, neither Leung nor Perets disclose "select the particular pilot filter response from among a plurality of possible pilot filter responses," as recited in claim 26. Rather, Perets discloses changing a noise flattening filter 22 used for a received signal R(n). Perets does not disclose using different pilot filter responses in channel estimation block 16 in FIG. 1, which is where a pilot filter normally resides.

Second, there is no suggestion or motivation to combine Leung with Perets. A receiver typically uses either a rake receiver in Leung or an equalizer and a noise flattening filter in Perets.

For at least the above reasons, Applicant submits that claim 26 is patentable over Leung in view of Perets. Claim 29 is dependent on claim 26 and is patentable for at least the reasons noted for claim 26.

Claim 30 includes the features noted above for claim 26 and is patentable for at least the reasons noted for claim 26.

Accordingly, the §103(a) rejection of claims 26, 29 and 30 should be withdrawn.

### CONCLUSION

In light of the amendments contained herein, Applicant submits that the application is in condition for allowance, for which early action is requested.

Please charge any fees or overpayments that may be due with this response to Deposit Account No. 17-0026.

Respectfully submitted,

Dated: 6/13/06

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